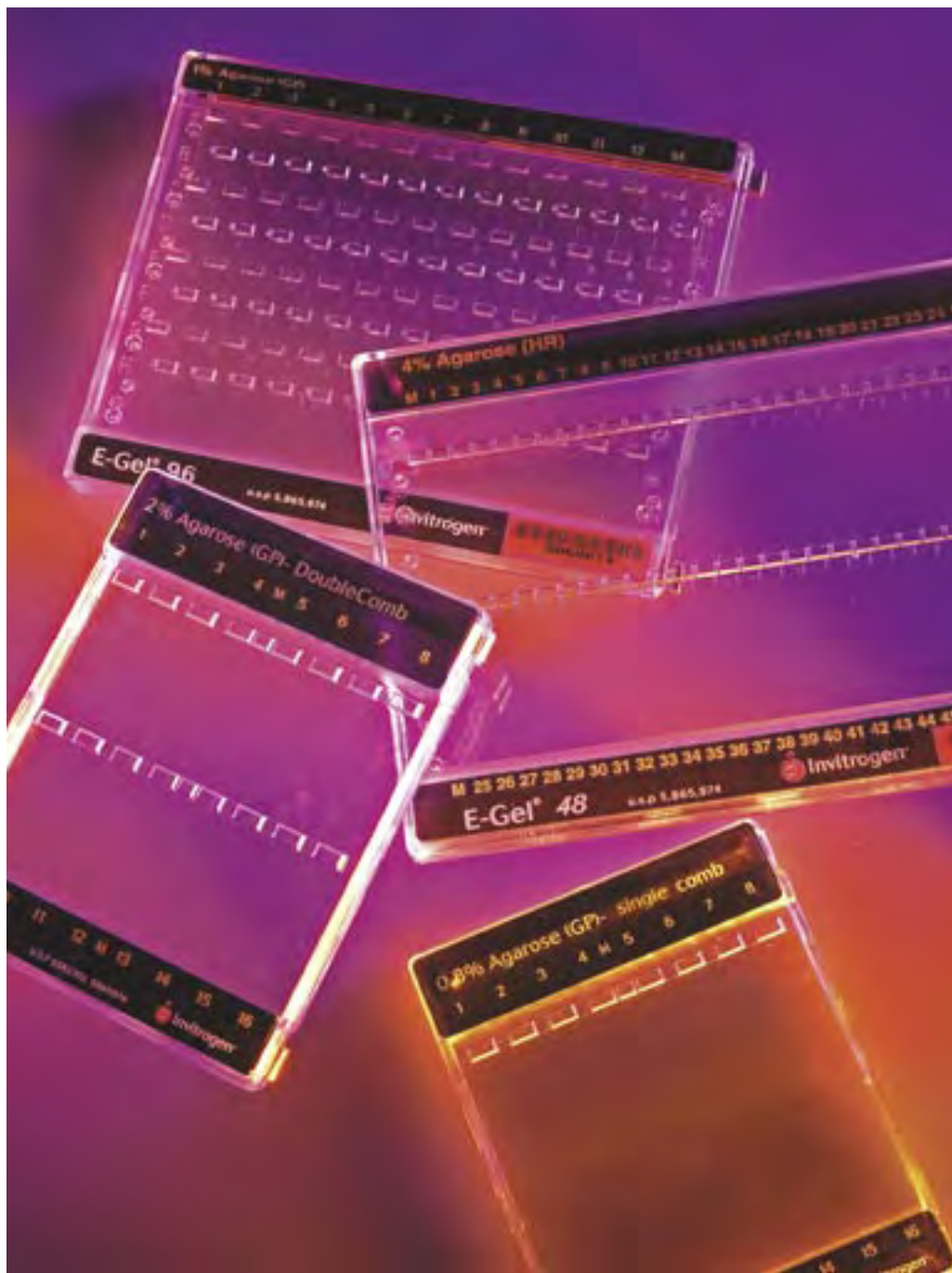




E-Gels – Fast, agarose gel electrophoresis for every throughput need



E-Gels offer:

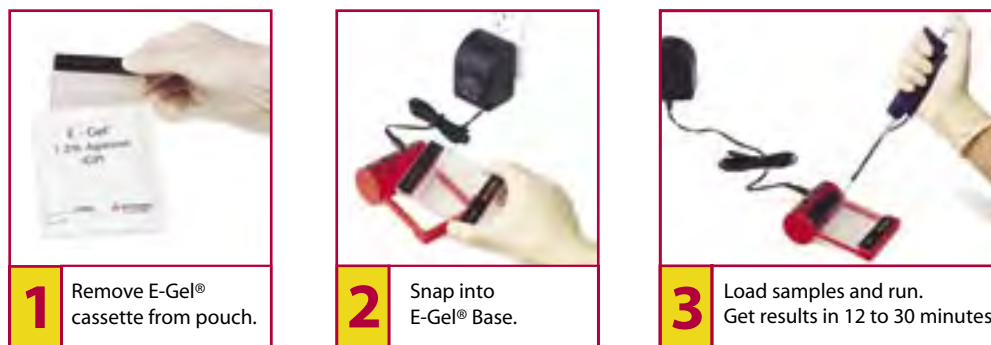
- Simple setup
- Fast analysis
- Reliable results

...in the well format and throughput you need

E-Gels make agarose electrophoresis convenient, fast, and easy to run

E-Gel® pre-cast agarose gels are designed for fast, convenient, and easy-to-run electrophoresis. Each E-Gel® is a self-contained, complete electrophoresis system that includes agarose, ethidium bromide, electrodes, and patented ion-exchange matrices contained inside a disposable, UV-transparent cassette. With E-Gels, you don't need to pour gels, make buffer, or even have a gel box and power supply. Just load your samples and run (Figure 1). You'll have results in as little as 12 minutes. E-Gels are available in a variety of formats and agarose percentages to meet all of your throughput needs.

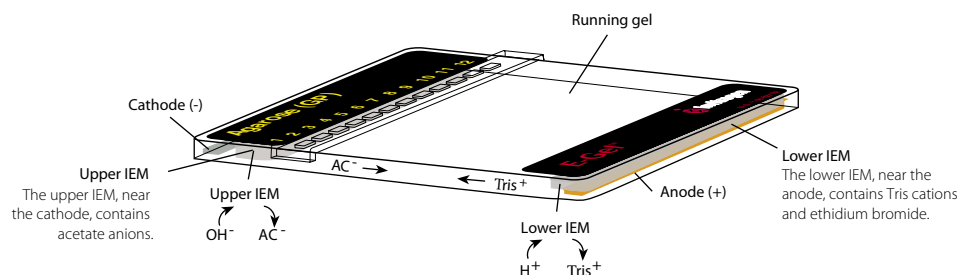
Figure 1 – Using E-Gels is as easy as 1-2-3



Innovative, patented technology saves time

E-Gel® cassettes contain two unique ion exchange matrices (IEMs) that are in contact with the running gel and electrodes (Figure 2). The IEMs supply a continuous flow of ions throughout the gel. This patented technology results in a sustained electric field with enhanced buffering capacity that eliminates the need for liquid buffer and exposure to ethidium bromide.

Figure 2 – Location of the IEMs in an E-Gel® cassette

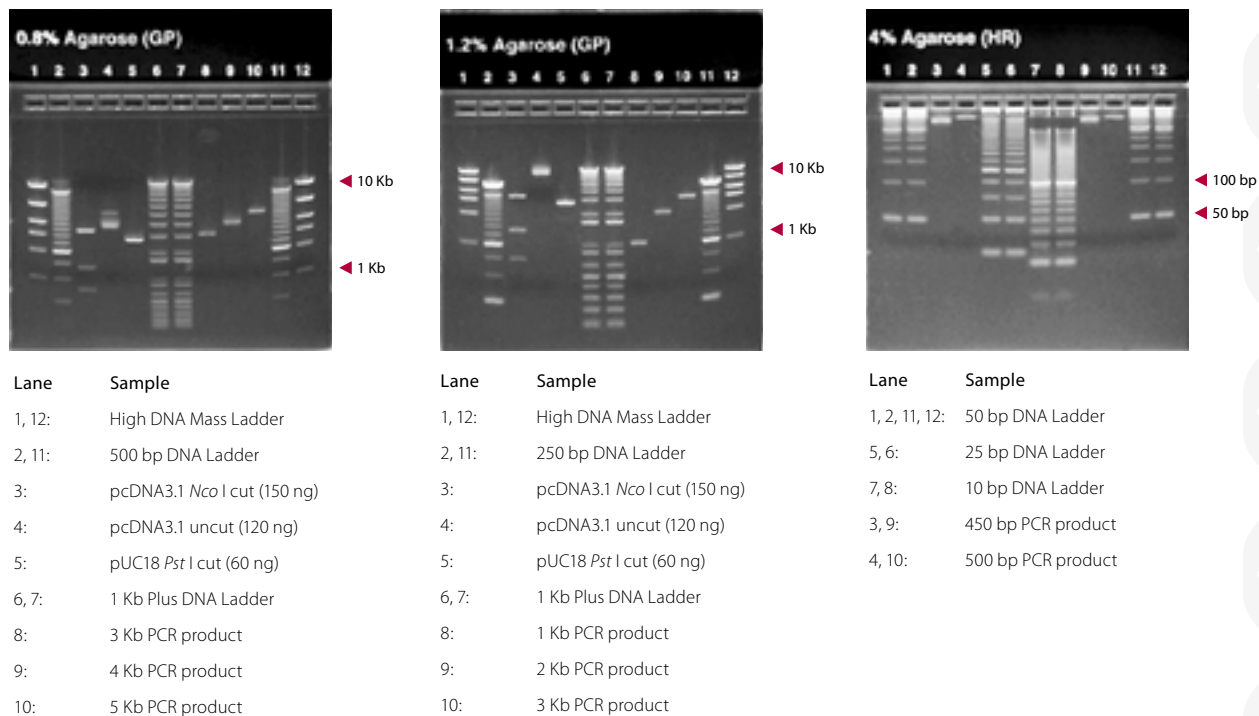


Protons and hydroxyl ions, by-products of water electrolysis generated during electrophoresis, are exchanged by Tris, ethidium, and acetate ions in the IEMs.

High resolution and clear results in a 12-well format

With E-Gels, you get great results with every gel. To demonstrate the high resolution and uniformity achieved with E-Gels, various samples were run on 0.8%, 1.2%, and 4% 12-well single comb E-Gels. Results show clear, discrete bands that are easily seen on a UV transilluminator (Figure 3).

Figure 3 – Sample loading and electrophoresis results using single comb E-Gels

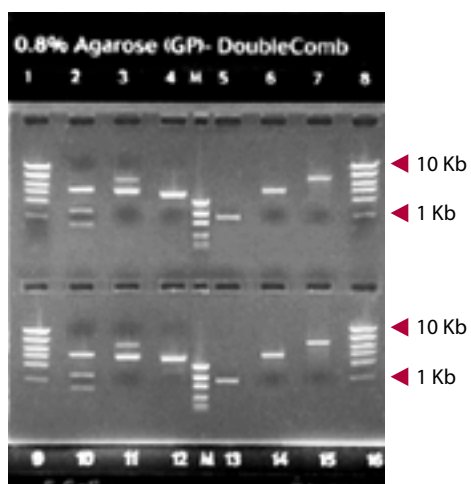


All samples were diluted to a volume of 20 μ l in 0.05X BlueJuice™ Gel Loading Buffer and water. Each lane contains 20 μ l of each sample. The gels were run under standard E-Gel® electrophoresis conditions (70 V for 30 minutes) and visualized on a UV transilluminator.

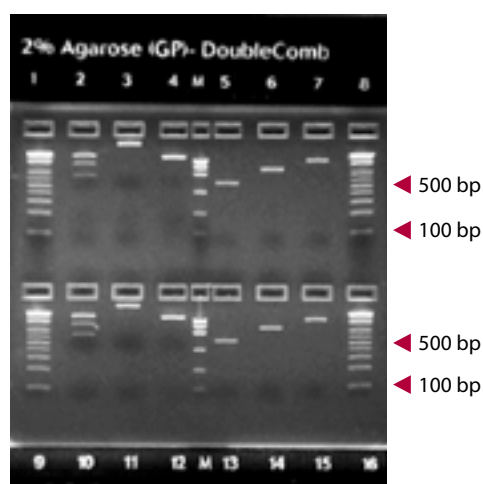
Increase your everyday throughput with 16-well double comb E-Gels

E-Gel® double comb gels allow you to resolve 16 sample wells and 2 marker wells in just 15 minutes. Each E-Gel® double comb cassette provides two rows of 8 sample wells and 1 marker well spaced for compatibility with eight-channel pipettors to give you multiple sample loading flexibility and increased throughput.

Figure 4 – Sample loading and electrophoresis results using double comb E-Gels



Lane	Sample
1, 8, 9, 16:	High DNA Mass Ladder
2, 10:	pcDNA3.1 <i>Nco</i> I cut (150 ng)
3, 11:	pcDNA3.1 uncut (120 ng)
4, 12:	pUC18 <i>Pst</i> I cut (60 ng)
M:	Low DNA Mass Ladder
5, 13:	1 Kb PCR product
6, 14:	3 Kb PCR product
7, 15:	5 Kb PCR product



Lane	Sample
1, 8, 9, 16:	1 Kb Plus DNA Ladder
2, 10:	pcDNA3.1 <i>Nco</i> I cut (150 ng)
3, 11:	pcDNA3.1 uncut (120 ng)
4, 12:	pUC18 <i>Pst</i> I cut (60 ng)
M:	Low DNA Mass Ladder
5, 13:	500 bp PCR product
6, 14:	1 Kb PCR product
7, 15:	2 Kb PCR product

Power up with the E-Gel® PowerBase™ v.4

The E-Gel® PowerBase™ v.4 simplifies electrophoresis because it's a base and power supply all in one (Figure 5). To use, simply place your E-Gel® into the PowerBase™, attach the AC adaptor provided, plug into the nearest electrical outlet, and run. The E-Gel® PowerBase™ v.4 has a built-in timer, alarm, and three-color lighted display that indicate when specific programs begin and end ... and the automatic shut off prevents gels from ever overrunning.

Figure 5 – The E-Gel® PowerBase™ v.4



Try out E-Gels with a convenient E-Gel® Starter Pak

For your convenience, E-Gels are available in trial size Starter Paks. Each Starter Pak contains 6 single comb E-Gels in 0.8, 1.2, 2, or 4% agarose along with an E-Gel® PowerBase™ v.4 (Figure 6). All you need are your samples and you're ready to experience the convenience of E-Gels.

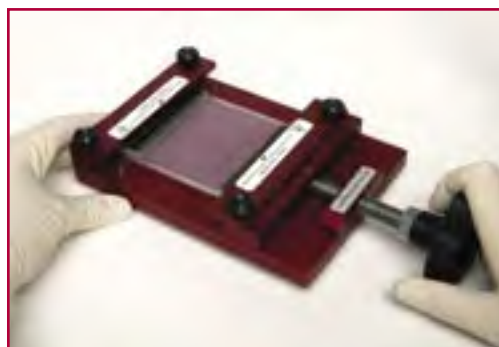
Figure 6 – The convenient E-Gel® Starter Pak



Easily open E-Gel® cassettes with the E-Gel® Opener

E-Gel® cassettes are quickly opened with the E-Gel® Opener (Figure 7) for further analysis of your samples. Simply place the cassette into the Opener and turn the knob to tighten. Two steel blades quickly pop open the E-Gel® cassette without harming your gel. In only a few seconds, your E-Gel® is ready for purification of DNA fragments or Southern blot analysis.

Figure 7 – The E-Gel® Opener



Medium throughput E-Gel® 48 gels for automation flexibility

E-Gel® 48 gels are ready-to-use, 48-well agarose gels designed for medium throughput analysis of PCR products and DNA fragments. Each gel contains 48 sample wells and 4 marker wells with a 3.2 cm run length. Load E-Gel® 48 gels with a multi-channel pipettor or automated liquid handling systems* for increased throughput (Figure 8). DNA bands resolve clearly in just 20 minutes (Figure 9).

Figure 8 – Loading an E-Gel® 48 gel using a liquid handling robot



* Robotic scripts for loading E-Gel® 48 gels with various liquid handling systems are available on the Invitrogen website at www.invitrogen.com/egels.

Figure 9 - Clear electrophoresis results on a 4% E-Gel® 48 gel



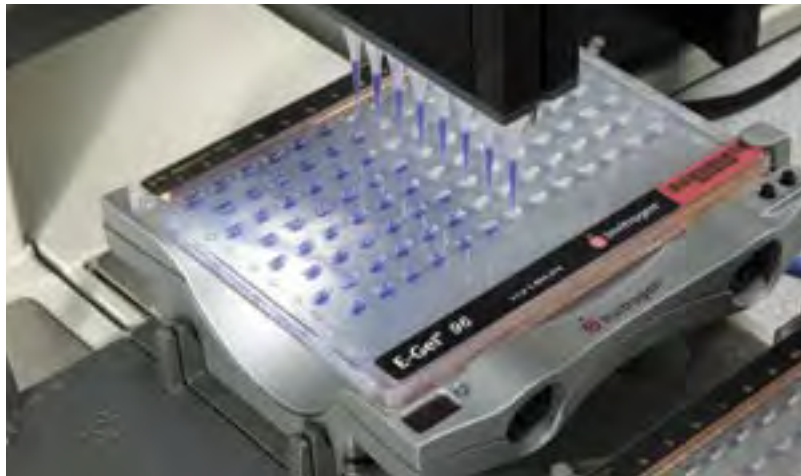
Lane	Sample	Lane	Sample
1, 20, 21, 38, 39, 48, M (lower right)	25 bp DNA Ladder (0.5 µg/well)	16, 30, 31	PCR product, 72 bp (100 ng/well)
2, 3	Synthetic 21 mer siRNA (short interfering RNA, 100 ng/well)	17, 32, 33	PCR product, 150 bp (100 ng/well)
4, 5	Undiced dsRNA (100 ng/well)	18, 40, 41	PCR product, 240 bp (100 ng/well)
6, 7	dsRNA diced (cut) with Dicer enzyme (100 ng/well)	19, 42, 43	PCR product, 317 bp (100 ng/well)
8, 13, 14, 34, 35	E-Gel® Low Range Quantitative DNA Ladder (10 µl/well)	22	ssDNA, 60 mer (200 ng/well)
9, 10, 44, 45	PCR product <i>Hinf</i> I cut	23	ssDNA (lane 22) annealed to form dsDNA, 60 bp (100 ng/well)
11, 12, 36, 37	PCR product Aat II cut	24, 25, M (lower left)	50 bp DNA Ladder (0.5 µg/well)
15, 28, 29	PCR product, 40 bp (100 ng/well)	26, 27, M (upper right)	100 bp DNA Ladder (0.5 µg/well)
		46, 47, M (upper left)	10 bp DNA Ladder (1 µg/well)

48-well E-Gels for medium throughput

E-Gel® 96 – A breakthrough in high-throughput electrophoresis

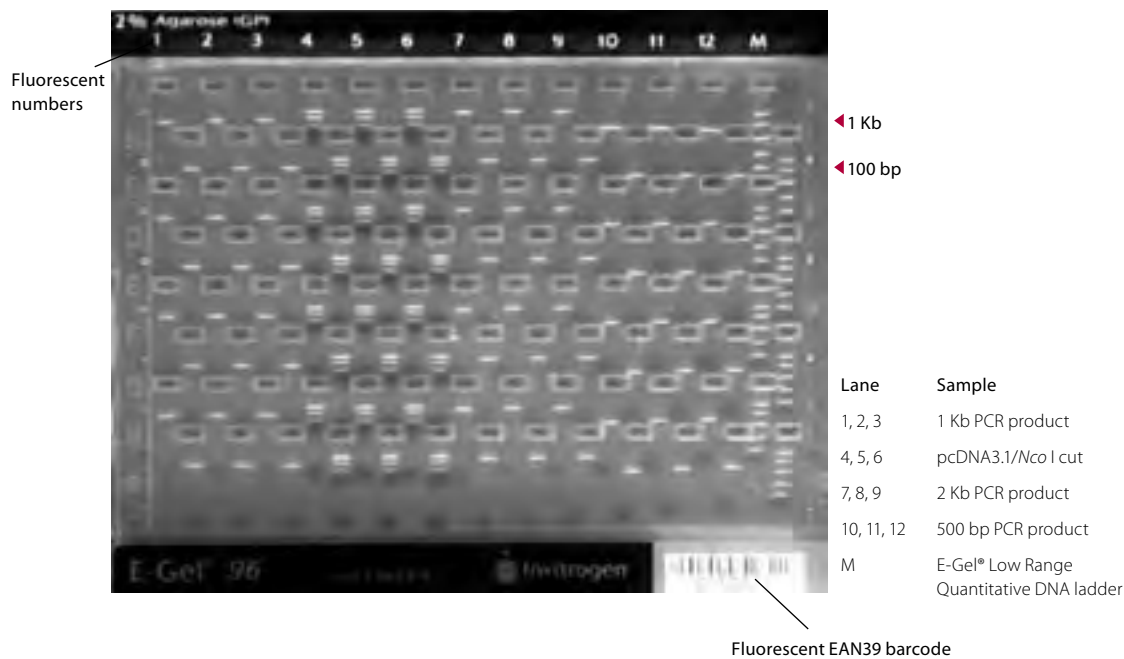
E-Gel® 96 gels are designed for fast, high-throughput electrophoresis of multiple DNA samples at one time. Each gel contains 96 sample wells and 8 marker wells in a patented, staggered-well format that is compatible with 8-, 12-, and 96-tip automated loading robots (Figure 10) to provide optimum performance and resolution in high-throughput applications* (Figure 11). With just 12-minute run times, up to 20,000 samples can be run in a single day, saving you weeks of screening time.

Figure 10 – Loading an E-Gel® 96 gel using an automated liquid handling robot



* Robotic scripts for loading E-Gel® 96 gels with various liquid handling systems are available on the Invitrogen website at www.invitrogen.com/egels.

Figure 11 – Electrophoresis results on a 2% E-Gel® 96 gel



Integrated power supplies for fast, automated electrophoresis

E-Gel® 48 and E-Gel® 96 gels run on a specially designed, space-saving system of Mother and Daughter bases – each a combined gel base and power supply all in one. These integrated, all-inclusive power supplies have a small bench-top footprint measuring only 5.5 x 6 inches per base (Figure 12), and can be plugged directly into any standard electric outlet. Connect multiple Daughter E-Bases to the Mother E-Base™ to create a multi-unit system (Figure 13) capable of running over twenty gels at once in just 12 minutes.

Figure 12 – The Mother E-Base™ and Daughter E-Base™ combination

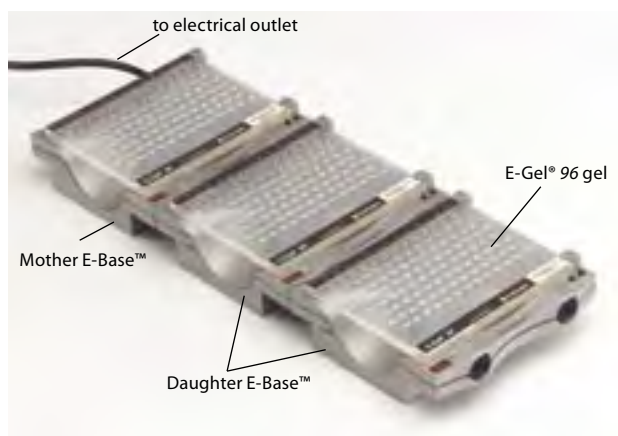


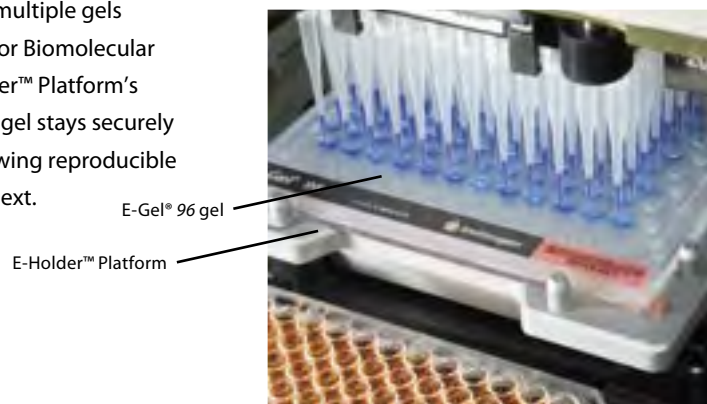
Figure 13 – Over twenty E-Gel® 48 or E-Gel® 96 gels can be run at once



Load E-Gel® 48 and 96 gels robotically on the E-Holder™ Platform

The handy E-Holder™ Platform is used to keep E-Gel® 48 and 96 gels stable during robotic loading of multiple gels (Figure 14). Designed with the SBS (Society for Biomolecular Screening) standard plate format, the E-Holder™ Platform's spring-loaded mechanism ensures that each gel stays securely in place when the robotic arm moves — allowing reproducible placement and loading from one gel to the next.

Figure 14 – The E-Holder™ Platform on a liquid handling robot



The E-Editor™ 2.0 software for **easy analysis** of E-Gel® 48 and 96 gels

Analysis of E-Gel® 48 and 96 gel results is fast and easy using the E-Editor™ 2.0 software*. The E-Editor™ 2.0 software takes the digital image from your gel and reconfigures the lanes into one re-grouped and aligned image (Figure 15) for easy comparison, documentation, and reference back to the original plate coordinates and for quick identification of important results. The E-Editor™ software is available FREE of charge with the purchase of E-Gel® 48 and 96 gels and related equipment*.

Figure 15 – Analyze E-Gel® 48 and 96 gel results using the E-Editor™ 2.0 software



Lanes from the E-Gel® 96 gel image are aligned using the E-Editor™ 2.0 software.

Reconfigured E-Editor™ 2.0 gel data is easily analyzed.

* This software is covered by a software license agreement and may be downloaded in PC format from the Invitrogen web site at www.invitrogen.com/egels.

Convenient DNA markers for E-Gels

Invitrogen carries a wide selection of DNA markers ranging from 10 bp to 12 Kb so you can accurately estimate the molecular weight of your DNA bands (Figure 16). Here we've pre-selected DNA markers* to make it easy to analyze DNA fragments on all types of E-Gels (Table 1).

Figure 16 – Pre-selected DNA markers for E-Gels

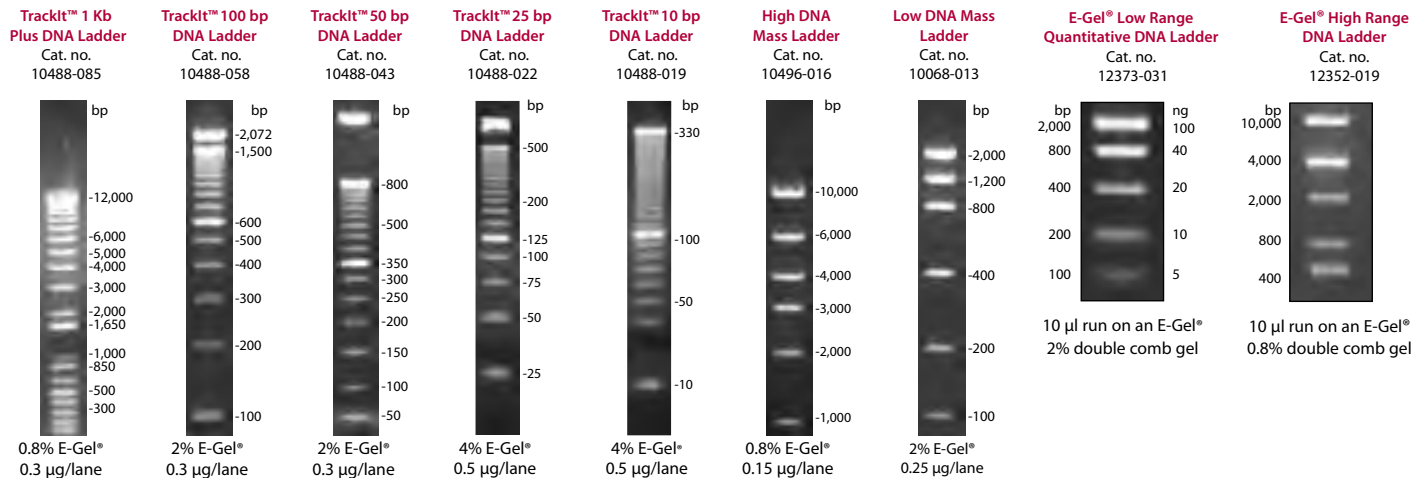


Table 1 – DNA marker selection guide for E-Gels

Product	% Agarose	Suggested marker	Quantity	Cat. no.
Single comb E-Gels	0.8%	1 Kb Plus DNA Ladder 500 bp DNA Ladder High DNA Mass Ladder	250 µg 100µg 50 apps	10787-018 10594-018 10496-016
	1.2%	100 bp DNA Ladder TrackIt™ 100 bp DNA Ladder TrackIt™ 1 Kb DNA Ladder 1 Kb Plus DNA Ladder High DNA Mass Ladder	50 µg 100 apps 100 apps 250 µg 50 app	15628-019 10488-058 10488-072 10787-018 10496-016
	2%	50 bp DNA Ladder TrackIt™ I DNA/ <i>Hind</i> III fragments TrackIt™ ϕX174 RF DNA/ <i>Hae</i> III fragments 25 bp DNA Ladder 1 Kb Plus DNA Ladder	50 µg 100 apps 100 apps 50 µg 250 µg	10416-014 10488-064 10488-037 10597-011 10787-018
	4%	10 bp DNA Ladder 25 bp DNA Ladder 50 bp DNA Ladder TrackIt™ 10 bp DNA Ladder TrackIt™ 25 bp DNA Ladder TrackIt™ 50 bp DNA Ladder	50 µg 50 µg 50 µg 20 apps 20 apps 100 apps	10821-015 10597-011 10416-014 10488-019 10488-022 10488-043
Double comb E-Gels	0.8%	High DNA Mass Ladder Low DNA Mass Ladder	50 apps 50 apps	10496-016 10068-013
	2%	1 Kb Plus DNA Ladder TrackIt™ 1 Kb Plus DNA Ladder 50 bp DNA Ladder TrackIt™ 50 bp DNA Ladder Low DNA Mass Ladder	250 µg 100 apps 50 µg 100 apps 50 apps	10787-018 10488-085 10416-014 10488-043 10068-013
E-Gel® 48 gels	1%	E-Gel® High Range DNA Ladder	100 apps	12352-019
	2%, 4%	E-Gel® Low Range Quantitative DNA Ladder	100 apps	12373-031
E-Gel® 96 gels	1%	E-Gel® High Range DNA Ladder	100 apps	12352-019
	2%	E-Gel® Low Range Quantitative DNA Ladder	100 apps	12373-031

*For a complete listing of Nucleic Acid Markers, please visit Invitrogen's website at www.invitrogen.com

Introducing E-Gel® with SYBR Safe™

The ultimate in electrophoresis speed, simplicity, and safety



New E-Gel® pre-cast gels with SYBR Safe™ DNA gel stain combines the best in electrophoresis: the convenience of bufferless, plug-and-play E-Gel® pre-cast agarose gels with the enhanced safety of SYBR Safe™ DNA gel stain. SYBR Safe™ gel stain is already incorporated in the E-Gel® pre-cast gels, and you can use the same easy protocol as the original E-Gels. Just snap the gel into the E-Gel® Powerbase™ v.4, load your samples, and run. No messy buffers to make or tedious gels to pour — it's that fast and simple.

Directly visualize your DNA using a standard UV transilluminator* (Figure 1), or for even greater safety, a blue light transilluminator† or an imaging system such as a laser based scanner. By eliminating the need for ethidium bromide and UV illumination, you stop damaging your DNA and improve cloning efficiency (Figure 2) (1).

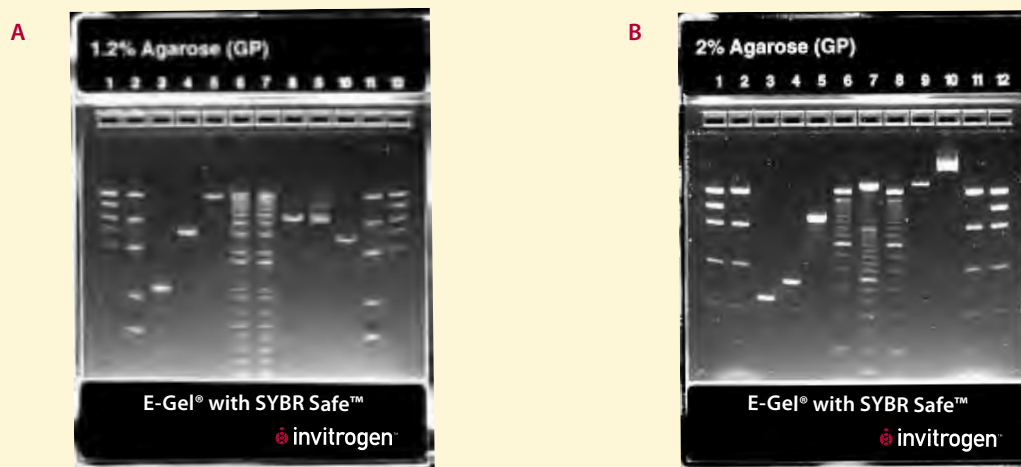
Stain smarter. Work safer.

The safer alternative to ethidium bromide, SYBR Safe™ DNA gel stain:

- Tests negative for genotoxicity and acute oral toxicity
- Tests negative for mutagenic transformations in SHE cell assays, unlike ethidium bromide
- Is not classified as hazardous waste under U.S. Federal Regulations
- Meets the requirements of the Clean Water Act and National Pollutant Discharge Elimination System regulations

For more information about the safety of SYBR Safe™ gel stain, visit <http://probes.invitrogen.com/sybrsafe>

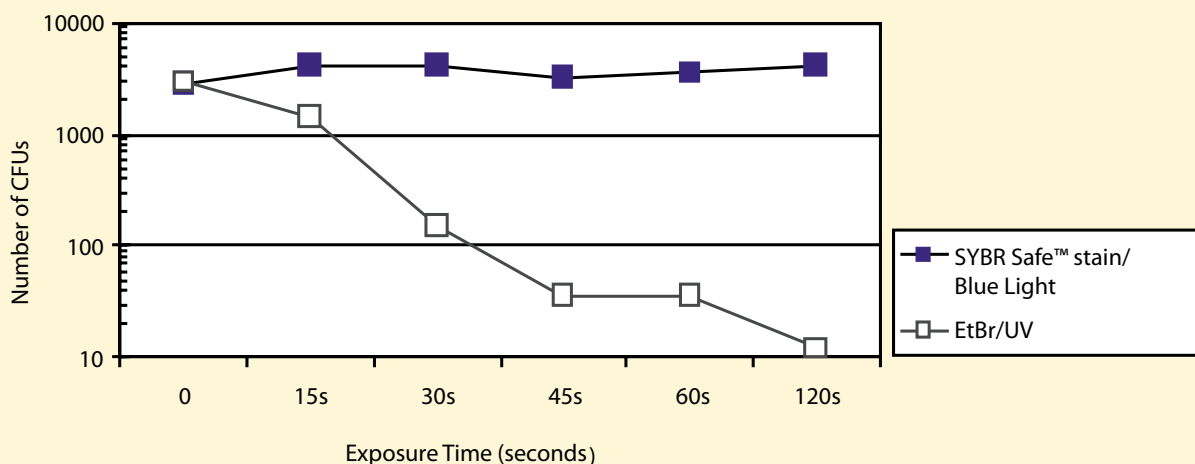
Figure 1 — Clear, easy to see bands with SYBR Safe™ DNA gel stain



A. E-Gel® 1.2% with SYBR Safe™ 1: High DNA Mass Ladder (1 µl, catalog no. 10496-016), 2: E-Gel® High Range DNA Ladder (20 µl, Cat. no. 12352-019), 3: 1 Kb PCR product (100 ng), 4: 3 Kb PCR product (200 ng), 5: 9 Kb PCR product (200 ng), 6: 1 Kb Plus DNA Ladder (0.5 µl, Cat. no. 10787-018), 7: 1 Kb Plus DNA Ladder (0.5 µl, catalog no. 10787-018), 8: pBR322 *Eco*R1 cut (100 ng), 9: pBR322 uncut (100 ng), 10: pUC19 *Eco*R1 cut (50 ng), 11: E-Gel® High Range DNA Ladder (20 µl, Cat. no. 12352-019), 12: High DNA Mass Ladder (1 µl, Cat. no. 10496-016). Samples were loaded in a total volume of 20 µl and visualized on a standard 300 nm UV transilluminator. Photographs were taken using the MiniBis photo documentation system from DNR, and the SYBR Safe™ photographic filter using an exposure time of 1.8 sec. .

B. E-Gel® 2% with SYBR Safe™ 1: Low DNA Mass Ladder (4 µl, Cat. no. 10068-013), 2: E-Gel® Low Range Quantitative DNA Ladder (20 µl, Cat. no. 12373-031), 3: 240 bp PCR product (500 ng), 4: 317 bp PCR product (700 ng), 5: 1 Kb PCR product (100 ng), 6: 100 bp DNA Ladder (0.9 µl, Cat. no. 15628-019), 7: 50 bp DNA Ladder (0.7 µl, Cat. no. 10416-014), 8: 100 bp DNA Ladder (0.9 µl, Cat. no. 15628-019), 9: pUC19 *Eco*R1 cut (50 ng), 10: pUC19 uncut (50 ng), 11: E-Gel® Low Range Quantitative DNA Ladder (20 µl, Cat. no. 12373-031), 12: Low DNA Mass Ladder (4 µl, Cat. no. 10068-013). Samples were loaded in a total volume of 20 µl and visualized on a standard 300 nm UV transilluminator. Photographs were taken using the MiniBis photo documentation system from DNR, and the SYBR Safe™ photographic filter using an exposure time of 1.8 sec.

Figure 2 — Even a 30-second exposure to ethidium bromide and UV reduced cloning efficiency



Gels loaded with equal amounts of a PCR product (1.25 kb gene fragment from Ultimate™ ORF IOH# 11050) were stained with either SYBR Safe™ (1:10,000 in TBE) or ethidium bromide (0.5 µg/ml in TBE) following electrophoresis. The gels were visualized on either a UV transilluminator (ethidium bromide) or blue light box (SYBR Safe™ stain), and bands excised after defined exposure times. DNA was purified from the gel fragments under identical conditions and used in parallel sub-cloning reactions. Following transformation into OneShot® TOP 10 chemically competent bacteria, three serial dilutions were plated and colonies counted using an Alpha Innotech imaging system. A plot of the experiment is shown above.

Ordering information

Order E-Gel® with SYBR Safe™ pre-cast gels today for the ultimate in electrophoresis speed, simplicity, and safety.

Product	Quantity	Cat. no.
E-Gel® 1.2% with SYBR Safe™ Starter Kit	1 kit†	G6206-01
E-Gel® 2% with SYBR Safe™ Starter Kit	1 kit†	G6206-02
E-Gel® 1.2% with SYBR Safe™	18 gels	G5218-01
E-Gel® 2% with SYBR Safe™	18 gels	G5218-02
SYBR Safe™ photographic filter	1	S37100

* Stained gels can be photographed using Polaroid® 667 black-and-white print film and the SYBR Safe™ photographic filter (S37100). A standard ethidium bromide photographic filter may not be appropriate for use. Please refer to the E-Gel® Technical Guide to determine the optimal filter sets to use, or contact the instrument manufacturer for advice.

† Coming Fall 2005 from Invitrogen.

‡ Each kit includes six gels and one E-Gel® Powerbase™ v.4. A SYBR Safe™ photographic filter is also included while supplies last.

Reference

1. In press (2005) *Quest*, 2(2).



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